

CLAIMS

1. A system for accessing at least one designated register of a PHY (physical layer) device in a communications network, the system comprising:
 - an extended protocol layer for generating an access command packet, the
 - access command packet containing an access command to access the at least one designated register of the PHY device; and
 - the PHY device, including the at least one designated register, for receiving the access command packet and executing the access command of the access command packet.
- 10 2. The system of claim 1, wherein the access command of the access command packet is a register read command for instructing the PHY device to read content stored in the at least one designated register of the PHY device, or is a register write command for instructing the PHY device to write certain data into the at least one designated register of the PHY device.
- 15 3. The system of claim 2, wherein, when the access command of the access command packet is a register write command, the access command packet contains therein the certain data to be written into the at least one designated register of the PHY device.

4. The system of claim 1, wherein the PHY device generates an access acknowledgment packet upon execution of the access command, the access acknowledgment packet acknowledging execution of the access command.

5. The system of claim 4, wherein the access acknowledgment packet is a register read acknowledgment packet for acknowledging execution of a read operation on the at least one designated register, or is a register write acknowledgment packet for acknowledging execution of a write operation on the at least one designated register.

10. The system of claim 5, wherein, when the access acknowledgment packet is a register read packet, the register read packet contains contents read from the at least one designated register of the PHY device.

7. The system of claim 4, wherein at least one of the access command packet and the access acknowledgment packet is in a standardized data packet format.

15. The system of claim 4, further comprising:
a MAC (media access controller) driver for communicating with the extended protocol layer;

a MAC device being controlled by the MAC driver; and
an interface for interfacing communication between the MAC device and the
PHY device.

9. The system of claim 8, wherein each of the MAC driver, the MAC device
5 and the interface processes the access command packet and the access
acknowledgment packet as standardized data packets.

10. The system of claim 9, further comprising:
protocol and application layers for communicating with the extended protocol
layer.

10 11. An extended PHY (physical layer) device for use in a network system, the
extended PHY device including registers for storing data, the extended PHY device
being capable of recognizing an access command packet, executing the access
command packet, and generating an access acknowledgment packet in response to the
access command packet, the access command packet containing an access command
15 to access at least one of the registers of the extended PHY device.

12. The extended PHY device of claim 11, wherein the access command of the access command packet is a register read command for instructing the extended PHY device to read content stored in the at least one register of the PHY device, or is a register write command for instructing the extended PHY device to write certain data 5 into the at least one register of the extended PHY device.

13. The extended PHY device of claim 12, wherein, when the access command of the access command packet is a register write command, the access command packet contains therein the certain data to be written into the at least one register of the extended PHY device.

10 14. The extended PHY device of claim 11, wherein the PHY device generates an access acknowledgment packet upon execution of the access command packet, the access acknowledgment packet acknowledging execution of the access command packet.

15. The extended PHY device of claim 14, wherein the access acknowledgment packet is a register read acknowledgment packet for acknowledging execution of a read operation on the at least one register of the extended PHY device,

or is a register write acknowledgment packet for acknowledging execution of a write operation on the at least one register of the extended PHY device.

16. The extended PHY device of claim 15, wherein, when the access acknowledgment packet is a register read packet, the register read packet contains 5 contents read from the at least one designated register of the PHY device.

17. The system of claim 15, wherein at least one of the access command packet and the access acknowledgment data packet is in a standardized data packet format.

18. A computer program product embodied in computer readable media as an extended protocol layer of a network system, for accessing at least one designated 10 register of a Physical (PHY) device of the network system, the computer program product comprising computer executable instructions for:

generating an access command packet, the access command packet including an access command to access the at least one designated register of the extended 15 Physical (PHY) device;

transmitting the generated access command packet to another computer program product that controls a Media Access Controller (MAC) device, so that the at least one designated register of the extended PHY device can be accessed.

19. The computer program product of claim 18, wherein the access command
5 is a register read command for instructing the extended PHY device to read content stored in the at least one designated register of the PHY device, or is a register write command for instructing the extended PHY device to write certain data into the at least one designated register of the extended PHY device.

20. The computer program product of claim 19, wherein, when the access
10 command is a register write command, the access command packet contains the certain data to be written into the at least one designated register of the extended PHY device.

21. The computer program product of claim 18, further comprising computer executable instructions for:
15 receiving an access acknowledgment packet from the extended PHY device, the access acknowledgment packet acknowledging execution of the access command; and processing the access acknowledgment packet.

22. The computer program product of claim 21, wherein the access acknowledgment packet is a register read acknowledgment packet for acknowledging execution of a read operation on the at least one designated register of the extended PHY device, or is a register write acknowledgment packet for acknowledging execution 5 of a write operation on the at least one designated register of the extended PHY device.

23. The computer program product of claim 22, wherein at least one of the access command packet and the access acknowledgment packet is in a standardized data packet format.